

11) $x^2 + 4y^2 = 11$, $4x^2 + y^2 = 4$ then $x^4 + y^4 + 2x^2y^2 + 1 =$ _____

- 1) Multiple of 3 2) Divisible by 7
3) Multiple of 6 4) Divisible by 5

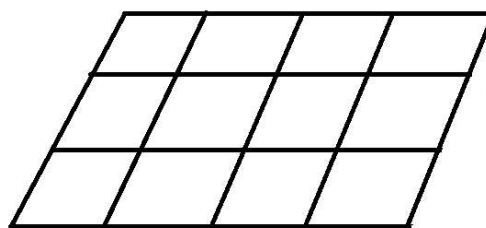
12) Possible number of sundays in a leap year is _____
1) 53 2) 54 3) 55 4) 56

13) Area of an equilateral triangle of height h is $\sqrt{3}$ sq.u. If the length of the side is a . Then the value of $\frac{2h^2 - a^2}{2h^2 + a^2} =$ _____

- 1) 0.2 2) $\sqrt{3}$ 3) 1 4) $\frac{2}{3}$

14) Number of parallelograms in the network is _____

- 1) 20 2) 60
3) 40 4) 28



15) In a certain code : $2*3 = -1$, $3*4 = -5$, $7*4 = -17$, $5*6 = -19$ then $1*5 + 2*4 =$ _____

- 1) -2 2) -1 3) -14 4) 17

16) Which of the following is the perfect number as per number theory ?

- 1) 12 2) 16 3) 11 4) 28

17) If $x^3 + y^3 + 3xy = 1$ then the least value of $x + y$ is _____

- 1) -2 2) 1 3) 0 4) -3

18) $a = 2023$, $b = 2024$, $c = 2025$ then $(a^2 + b^2 + c^2 - ab - bc - ca)^2 + 1$ is equal to _____

- 1) 10 2) 12 3) 2 4) 411870

19) In a class boys and girls are in the ratio 3: 2. Average mark of total class is 60 boys average mark is 70 then girls average mark is _____

- 1) 40 2) 35 3) 45 4) 56

- 20) A circle has a diameter with ends (0, 0) (6, 8). Then the ratio of its area to circumference is _____
- 1) 2.5 2) 4.2 3) $\frac{4}{3}$ 4) $\frac{3}{4}$
- 21) $x^3 - 6x^2 + 11x - 6$ is exactly divisible by $(x-a-1)(x-b-1)(x-c-1)$ then $ab^2c^3 + ab + bc - 1 =$ _____ where $a \neq b \neq c$, $a < b < c$
- 1) 0 2) 1 3) 2 4) -2
- 22) In a cuboid if x, y, z respectively denote number of vertices, faces and edges then $x^2 + y^2 + z^2 + 2xy - 2zx - 2yz + 6 =$ _____
- 1) 8 2) 14 3) 12 4) 10
- 23) Product of digits in kaprekar's constant is _____
- 1) 0 2) 18 3) 168 4) 160
- 24) For moderatery asymmetric data $\frac{\text{mean} - \text{mode}}{\text{mean} - \text{median}} =$ _____
- 1) nearly 2 2) 3 3) nearly 5 4) 4
- 25) Number of integer solution pairs $2x^2 + y^2 + 2xy + 2x + 1 = 0$ (x, y)
- 1) only 2 2) zero 3) only one 4) atleast 2
- 26) Which of the following is a perfect 4th power ?
- 1) $21^3 \times 7^5 \times 3^3$ 2) $45^9 \times 3^6 \times 5^3$ 3) $20^7 \times 2^5 \times 5^{11}$ 4) $100^2 \times 20^3$
- 27) If the angles of the triangle are in the ratio 1:1:2 then the corresponding sides are in the ratio _____
- 1) $\sqrt{2} : \sqrt{2} : 2$ 2) $1:1:\sqrt{3}$ 3) $3:6:\sqrt{7}$ 4) $1:2:3$
- 28) Zero in mathematics was an invention of
- 1) Indian 2) American 3) Australian 4) Russian
- 29) National mathematics day is celebrated on _____ every year.
- 1) 19th October 2) 22nd January 3) 22nd December 4) 14th March
- 30) Which of the following point always lies within the triangle ?
- 1) Orthocentre 2) Centroid 3) Ex-centre 4) Circumcentre

- 31) The country in which international mathematical olympiad was conducted in 2023 was _____
 1) India 2) Romania 3) Australia 4) Japan
- 32) Golden ratio is nearly _____
 1) 1.414 2) 1.618 3) 2.7183 4) 1.732
- 33) If $\sqrt[3]{a+b\sqrt{2}} = 1+\sqrt{2}$ then $\sqrt[3]{a^2-2b^2} =$ _____
 1) -1 2) -2 3) $2+\sqrt{2}$ 4) $2-\sqrt{2}$
- 34) Number of real roots of $x^2(1+x^2)+1=0$ is _____
 1) 2 2) 0 3) -2 4) 4
- 35) $x = \frac{1}{1 \times 2} + \frac{1}{2 \times 3} + \frac{1}{3 \times 4} + \dots + \frac{1}{79 \times 80}$ then $80x - 72 =$ _____
 1) 3 2) 0 3) 30 4) 7
- 36) If the length of the rectangle is increased by 40% and breadth is decreased by 20% then the area of rectangle _____
 1) Increases by 42% 2) Decreases by 22%
 3) Increases by 12% 4) Decreases by 32%
- 37) $\frac{(2^3 + 4^3 + 6^3 + 8^3 + \dots + 64^3)^{\frac{1}{2}}}{\sqrt{2}} = k^2 + k$ largest prime factor of $k+1$ will be
 1) 11 2) 7 3) 13 4) 31
- 38) Find the next term of the following series $1, \frac{5}{9}, \frac{5}{14}, \frac{7}{65}, \dots$
 1) $\frac{26}{217}$ 2) $\frac{18}{91}$ 3) $\frac{17}{81}$ 4) $\frac{19}{71}$
- 39) If $p^2 + q^2 = 1$ then $p^2(3-4p^2)^2 + q^2(4q^2-3)^2 =$ _____
 1) 2 2) 3 3) 1 4) 0

- 40) Number of solution pairs (x, y) for $x + 4y - 1 = 0$ and $2x + 8y - 7 = 0$ is _____
 1) 2 2) 1 3) 0 4) Infinite
- 41) 25th term in the series 1, 3, 6, 10, 15, 21, will be
 1) $5^2 \times 13$ 2) 6^3 3) 7^4 4) 850
- 42) PA and PB are tangents to the same circle whose centre is O.
 $\angle AOP = 60^\circ$ then $\angle APB =$ _____
 1) 60° 2) 120° 3) 80° 4) 150°
- 43) Who is the author of the famous geometry book "The Elements" ?
 1) Mahaviracharya 2) Euclid 3) Aryabhata 4) Hypatia
- 44) Sum of all exterior angles of a regular Hexagon is _____
 1) 180° 2) 720° 3) 360° 4) 1024°
- 45) $(a-b)x^2 + (b-c)x + c - a = 0$ has roots $\alpha, \beta : \alpha \neq 1$ Then $\alpha^\beta + \beta^\alpha + 1 =$ _____
 1) a 2) b 3) c 4) None of these
- 46) If $\frac{a^{n+1} + b^{n+1}}{a^n + b^n} = 0.5(a+b)$ then $2n^2 + 3n + 6(n^3 + 1) =$ _____
 1) $(n+2)^2 + 2$ 2) $n^2 - 8$ 3) $n^3 + 5$ 4) $(n-1)^2 + 4$
- 47) In a rectangle ABCD, P is an interior point ; then $\left| \frac{PA^2 - PB^2}{PD^2 - PC^2} \right| =$ _____
 1) 2 2) -1 3) 1 4) 3
- 48) Inventor of Co-ordinate geometry was _____
 1) Rene Descartes 2) Pythagorus 3) Gauss C. F 4) Pappus
- 49) (0, 0) (3, 4) (0, 4) form a
 1) Right angled isosceles triangle 2) Equilateral triangle
 3) Right angled triangle 4) Isosceles triangle
- 50) Number of positive integral divisors of 100 is N then $|N^2 + N - 100| =$ _____
 1) N - 2 2) N + 1 3) 2N - 3 4) N - 4

- 51) $\frac{(x+y+z)^2 + (x+y-z)^2 + (x-y-z)^2 + (x-y+z)^2}{x^2 + y^2 + z^2}$ is an expression _____
- 1) Independent of x 2) Independent of y
3) Independent of z 4) Independent of aall x, y, z
- 52) For howmany integers in the expression $\sqrt{9-(n+2)^2}$ are real ?
- 1) 7 2) 3 3) 6 4) 0
- 53) An eight digit number is a multiple of 73 and 137. If the second digit from left is 7. What is 6th digit from left ?
- 1) 2 2) 5 3) 7 4) 3
- 54) A two digit number increases by 20% When its digits are reversed. The sum of digits of number is _____
- 1) 6 2) 8 3) 11 4) 9
- 55) Unit digits of $1+9+9^2+9^3+.....+9^{2007}$ is _____
- 1) 0 2) 2 3) 9 4) 1
- 56) Two of the sides of a triangle are 3 and 7 and third side is also integer length. Then the number of possible triangles is _____
- 1) 2 2) 10 3) 5 4) 4
- 57) $(\sqrt{13}, \sqrt{2})$, $(\sqrt{14}, 1)$ and $(\sqrt{6}, 3)$ are three points equidistant from _____
- 1) $(1, \sqrt{6})$ 2) (0, 0) 3) (1, -2) 4) $(\sqrt{13}, \sqrt{14})$
- 58) The number of different integers x that satisfy the equation $(x^2 - 5x + 5)^{x^2+11x+30} = 1$ is _____
- 1) 6 2) 4 3) 3 4) Infinite
- 59) A box of dimensions $40 \times 35 \times 28$ units is used to keep smaller cuboidal boxes so that no space is left between the boxes. If the big box is packed with 100 such smaller boxes of same size, the dimensions of smaller box will be
- 1) $2 \times 9 \times 5$ 2) $8 \times 7 \times 7$ 3) $4 \times 7 \times 2$ 4) $7 \times 7 \times 3$
- 60) In a Rhombus of side length 5, the length of one of the diagonals is atleast 6 and the length of the other diagonal is atmost 6, the maximum value of sum of diagonals is _____
- 1) $10\sqrt{2}$ 2) 14 3) $5\sqrt{6}$ 4) 12

